RS-INT
M-1, R

WORKING PLAN - contd. July 20, 1935.

Natural Reproduction of Ponderosa Pine

Part IV B. Study of advance reproduction in virgin stands. Procedure.

1. The general plan of study is an intensive examination and record of the amount, age, and distribution on the ground of reproduction under various site and stand conditions in the virgin forest. Study areas will be chosen to represent both "good" and "poor" stocking and condition of reproduction. They will be selected also with the aim of getting a wide and representative range of exposures, soils, and number, distribution, and character of seed trees (overhead stand). The study will be largely confined to the Bannock Creek drainage, and will thus serve a secondary purpose in broadening our knowledge of reproduction conditions as a basis of management of the Experimental Forest.

2. Select study areas or plots of ¼ to 1 acre in size to represent various combinations of the factors mentioned above. Each plot may show variation in reproduction and in a single related factor such as seed trees, but other factors should be as uniform as possible within its boundaries.

3. Describe each plot briefly under the following headings:

Plot number
Location - Drainage, Compartment, Block. (Plat on map)
Elevation - to nearest 100'; center of plot.
Site Class - (measure a few heights if necessary).
Exposure - to nearest octant.
Slope - average percentage, and range.
Soil - Three classes:
1. Gravelly sandy loam.
2. Sandy loam.
3. Loam.
Note on any unusual conditions, such as rocks.
Surface - Litter depth; presence of logs, rocks, etc.
Topographic Situation - Ridge top, Draw, Slope (upper, mid, or lower).
Stand - Age class, as typed; Ages actually represented (est.)
Vegetation - General density; variation; major species, in approximate order of abundance. (May show on map.)
Fire - year of last fire.
Miscellaneous notes of such things as insect attack, disturbance by man, rodent evidence - if possibly related to reproduction.

4. Record individual data for all trees over 9.5" d.b.h. on plot somewhat as for timber cruise:

Tree Number.
D.B.H. - to nearest inch.
Height - estimated to nearest 10'.
Dunning Tree Class.
Cone Production (potential, judged by cones on ground and by crown character):

0 - None
1 - Very light: 1 - 5 per year (average seed year).
2 - Light: 6-25
3.- Medium: 26-100
4.- Heavy: over 100

For snags record:
Number (same number series as living trees).
D.B.H.
Years dead (estimated).

5. Run rough parallel compass lines thru the area in such a direction and at such intervals (probably ½ or 1 chain) as to strike all the conditions of reproduction, stand, and ground cover represented. At the end of each chain (or other interval) establish a milacre quadrat, on which all reproduction will be tallied by species, age, and size. Each plot should contain a minimum of 10 quadrats and preferably 25 or more, the number varying with the variation in reproduction conditions encountered.

6. Cut off selected seedlings (the term seedling or reproduction as here used includes also saplings and possibly some small poles; anything up to __ years of age)at the base to determine age closely, checking with whorls and bud scars where possible. Examine a sufficient number in each apparent distinct class to be able to classify all others. Record in two groups: "free growing",and crowded or overtopped.

7. Measure annual (or periodic) height growth of the cut seedlings. Record in tabular form in tenths of feet.

8. Map the plot to show boundaries , quadrat layout, approximate seed tree and snag locations, and areas of major differences in reproduction conditions and ground cover. Plot boundaries need not be surveyed if adequately defined by topographic or timber stand features (area may be planimetered).

9. If soil differences are suspected of having an important relation to presence or condition of reproduction in any case, dig sample pits and

make a field examination and record of depth, texture, and organic matter in typical spots. A limited number of samples may be taken for more exact and detailed laboratory analysis if necessary.

Time and Personnel: A tentative minimum goal of 25 plots or study areas is set up. Whether more may be possible or desirable depends upon the rate of progress of the study and the variation encountered. The time of one junior forester, with two CCC assistants (or one technical assistant and one CCC) for not over one month may be devoted to the field work. As far as time permits, current preliminary computations should be made after 4 p.m. and at other odd times.

E.L.M.

Note: The procedure of this study was tried out by Connaughton, Worst, & — in areas in Bannock Creek. While data could be obtained as outlined, the study proved to be very time-consuming, the classification of some elements, such as site and soil, was difficult to make with any accuracy, the determination of seedling age was difficult and only approximate at best, and the data obtained would not have been adapted to statistical analysis. The latter defect - difficulty in analysis and interpretation of results - is the most serious. It is more or less inherent to this "case study" method, and is particularly troublesome where we have such a complex of factors. The scheme was abandoned in favor of the "Harvest Study" of 1935-7, which (over)

gives usable results only for new seedlings, but incorporates some of the elements outlined here.

E. L. M.
as of 6/1/37.

At best the approach suggested here would not give a complete picture, as the surface, vegetational, shade, and climatic conditions at time of origin of seedlings are not known; they may have been materially different than at present.

It was also reasoned that, lacking as we would be in any nice accurate measurement of factors, if we were to get usable results from a limited number of areas, the particular circumstances favoring or inhibiting reproduction should be visible or at least we should have distinct "hunches" about them. General field observation have failed to yield conclusions that could be relied upon. A "hunch" obtained from observations in one spot fails to work out in another. While the close observation and the classification of conditions called for in this study might have given clues to the situation, it seemed rather hopless to expect much

Otter's studies of advance reproduction, in part along this line, were not conclusive in many respects, and some different approach seemed best.

The possibility of getting information from study of age and surrounding conditions of older reproduction in virgin stands, by some means or other, should not be forgotten entirely, however. Progress in other phases of the natural reproduction study may suggest efficient ways to study this phase later.